

AACTCCTTCTACACCCGAAAGGAATCCTATGACTATCAGGCAGCCTGTGCCCCCTCAGCCTCCTGGGAACC  
TGGGTGCTGCACCCCGGGGTGTCTTTGTGCCACCATTGCAGATTTCTTAACTTGGCCTGGTGGACCTC  
TGCTGCCGCCTGGTCCTTATTCCAGCAGCTACTCTATGGTCTCATCTATCACAGCTGGTTCCAGGCAGAC  
CCGGCAGAAGCTGAGGGCAGCCCCGAGACGCGCGAGAGCAGCTGCGTCATGAAACAGACCCAGTACTACT  
TCGGCTCGGTGAACGCATCCTATAATGCCATCATTGACTGCGGAACTGCAGCAGGCTGTTCCATGCGCA  
GAGACTGACCAACACCAATCTCCTGTTCTGTGGTGGCCGAGAAGCCGCTGTGCAGCCAGTGCAGGGCGGGC  
CGGCTGCTGCAGAAGGAGACACACTCGGACGGCCCCGAGCAGTGTGAGCTGGTGCAGAGACCGAGATACC  
GAAGAGGTCCGCACATCTGTTTTGACTACAATGCGACGGAAGATACCTCAGACTGTGGCCGCGGAGCCTC  
CTTCCCTCCGTCGCTGGGCGTCTTGGTTTCTTGCAGCTTTTGCTCCTCCTGGGCCTGCCACCTCGGCCG  
CAGCCTCAAGTCCACTCCTTCGCTGCCTCTCGCCACCTCTGAGCGACCCACACACACATCATACCCCC  
GCCTTGGCCTCCTAGCCTTTTCGCTCACCTCCCATTCCACATTCCTCAATCTAGAGCCTTGGCCACTCTC  
TCCTGAAGGACCTGGGTCCCTTCCCCCGGAGCCTGTGCCTTGGGGCAGGGGAACCCCAAAGTAAGGTGCC  
ATGGTGTTTGGCACTCAAGATTTAGCTCACCTTGAAGTGTCCAAGTCCCCGCAGTCCCTAGACTCATCC  
CCGTGGGCTAGGACAGGAGGCCACTAGTACTGATGCCAAACCAGGCCTCCACCGACCCACCTGCCTGGAG  
ATTTCTCTATGTAGGCAACCTGCCACTGCTGGGCACCTCTAACTGGCCCTTTGGCCCCACCCAAGCCC  
AAACTTACCTTCTCTGGGGGAAAAAAAAGGAAAGATGGTAATAGTGAGAGATTCGGGGGGGCACCCCTC  
CCCATTTGGTTTCTTGCCCTTTCAGGCTACAACCCCCCAGCCTTGCAGGTGTCAGAACAGTCTCACAATGA  
CATCAGTTTAGACACATGCCATATACACTTGGATCTCTGAGAGCAGAAACCAACTCTCACTAGACATAC  
CTGTGATGGAACACACAAACAGACACGCACCATGGGGGGTGGCCACAAAGCCTTACACAAGGCGAGATG  
TCAATGAAGGGGTTGGCCTGTGTGTTCCATCTCTGCTCACCTCTGCCTCTACTCTGAGATGCAGCCTGGC  
TGATCCTCCCATCTCTAAACTGAATGTCAAACCGTGCCAAATGCTGGGGGGGGGGGAGACCTCTCTGT  
TTCACCCCTAGCCACCAGTGTCCCCAAGTGCCCCCTCACCTGCCAGGTGCTCATTGTAACCATCGTTTAC  
CAGTGTCGGGCCCTAGTAGGACCACACATCACTGCCTGAACTCCTTTGGCAGAAGAACCCACCAGACA  
TTGAGACATTGTATTTTGCCTTAGCAGGGATGAGTTGGTCTCTCCTGGCTGGGCCATCCCATCCCCAATC  
TGGTTCTTGACACTCAGGCCTAATTTCCCTCTGCACACACACACACACACACACACACACACACACAC  
ACACACACACAGTCCCTGCCCCCTAGGAGGCCAAATTACCCCTCCCTTGCTGAACACACCCCTTGACCATG  
CACATGTCTAACCAACCGTACTGCACACACAGAGGCTGGACCTGGGACACATCTCTTTACACCTTTCATT  
CTGTCATTTCTCCCAAAGGCATCGTAACTTGGGGGCCAGGAGGGGACTGAGGGGCAGGGGGGAGGGGTGT  
AGCTGTGAGGCTCAGATGGACTGGGAGGAGGGGGGAGGGTGATACATTAATTAATGGCTTCGTTAATTAA  
TGTCATGTTGCTTGTGCTTTCTCAGTGTGTGTATGGTCCATGCCAGTGCTGGTGACAGGGTGGGTATC  
CATGATGTGTGCCAGCCTGGATGTCAGCTGTGTCCTGTGGGGGCGTGTGTGTAAGTGTAGTGTAGTCAG  
GTGCTCAACGGAGAATATAAACAAAAAAGAAACAAACGTATACAGAAAAATAAATGTATATTTTAA  
GTTTAAAGACAAATGAAACCAGACAAACAATCCCCATCAGGTAGTTGTCCAACCCCCAGCTGGGTTCAA  
CCCTCTCATTACCCACCTGACCTAGCTGTCCCTTACTGTGGGCTGGGGGACTTGGGGGCCATTTCTTTT  
GCCCTTTTTTTTTTGTGTTATTCTATTTTGTACAGACAAGTTGGGAAACAACAGCGACAAAAAAGTC  
GAGAACTTTGTAAAAATATTGTGTGTGTGATTTCCTTGTAATAATTTTCAAATGGTTTATTACAGAAGAT  
CAGTTATTAAATAATGTTTCATATTTTCACTTC (SEQ ID NO:1)

FIGURE 1



NSFYTRKESYDYQAACAPQPPGNLGAAPRGVVFVPTIADFLNLAWWTSAAAWSLFQQLLYGLIYH  
SWFQADPAEAEGSPETRESSCVMKQTQYYFGSVNASYNAIIDCGNCSRLFHAQRLTNTNLLFVV  
AEKPLCSQCEAGRLLQKETHSDGPEQCELVQRPRYRRGPHICFDYNATEDTSDCGRGASFPPSL  
GVLVSLQLLLLLGLPPRPQPQVHSFAASRHL (SEQ ID NO:2)

**FIGURE 2**

Figure 2



underlin d = deleted in targeting construct

**BOLD** = sequence flanking Neo insert in targeting construct

**AACTCCTTCTACACCCGAAAGGAATCCTATGACTATCAGGCAGCCTGTGCCCTCAGCCT**  
**CCTGGGAACCTGGGTGCTGCACCCCGGGGTGTCTTTGTGCCACCATTGCAGATTTTCCTT**  
**AACTTGGCCTGGTGGACCTCTGCTGCCGCTGGTCCTTATTCAGCAGCTACTCTATGGT**  
**CTCATCTATCAGCTGGTTCCAGGCAGACCCGGCAGAAGCTGAGGGCAGCCCCGAGACG**  
CGCGAGAGCAGCTGCGTCATGAAACAGACCCAGTACTACTTCGGCTCGGTGAACGCATCC  
TATAATGCCATCATTGACTGCGGAACTGCAGCAGGCTGTTCCATGCGCAGAGACTGACC  
AACACCAATCTCCTGTTCTGTTGGTGGCCGAGAAGCCGCTGTGCAGCCAGTGCAGGGCGGGC  
CGGCTGCTGCAGAAGGAGACACACTCGGACGGCCCCGAGCAGTGTGAGCTGGTGCAGAGA  
CCGAGATACCGAAGAGGTCCGCACATCTGTTTTGACTACAATGCGACGGAAGATACCTCA  
GACTGTGGCCGCGGAGCCTCCTTCCCTCCGTCGCTGGGCGTCTGGTTTCCTTGCAGCTT  
TTGCTCCTCCTGGGCTGCCACCTCGGCCCGCAGCCTCAAGTCCACTCCTTCGCTGCCTCT  
CGCCACCTCTGAGCGACCCACACACACATCATACCCCGCCTTGGCCTCCTAGCCTTT  
CGCTCACCTCCCATTCCACATTCCCCAATCTAGAGCCTTGGCCACTCTCTCCTGAAGGA  
CCTGGGTCCCCTCCCCCGGAGCCTGTGCCTTGGGGCAGGGGAACCCCAAAGTAAGTGCC  
ATGGTGTGGTGGCACTCAAGATTTAGCTCACCTTGAAGTGTCAAGTGCCCGCAGTCCCT  
AGACTCATCCCCGTGGGCTAGGACAGGAGGCCACTAGTACTGATGCCAAACCAGGCCTCC  
ACCGACCCACCTGCCTGGAGATTTCTCTATGTAGGCAACCTGCCACTGCTGGGCACCT  
CTAACTGGCCCTTTGGCCCCACCCAAGCCCAAACTTACCTTCTCTGGGGGAAAAAAAAAG  
GAAAGATGGTAATAGTGAGAGATTGGGGGGCACCCCTCCCCATTGGTTTCTGGCCCTT  
TCAGGCTACAACCCCCCAGCCTTGCAGGTGTGAGAACAGTCTCACAATGACATCAGTTTA  
GACACATGCCATATACACTTGGATCTCTGAGAGCAGAAACCCAACCTCTACTAGACATAC  
CTGTGATGGAACACACAACAGACACGCACCATGGGGGGTGGCCACAAAGCCTTACACA  
AGGCGAGATGTCAATGAAGGGGTGGCCTGTGTGTTCCATCTCTGCTCACCTCTGCCTCT  
ACTCTGAGATGCAGCCTGGCTGATCCTCCCATCTCTAAACTGAATGTCAAACCGTGCCA  
AATGCTGGGGGGGGGGGAGACCTCTCTGTTTACCCCTAGCCACCAGTGTCCCCAAGTG  
CCCCTCACCTGCCAGGTGCTCATTGTAACCATCGTTACCAAGTGTCCGGCCCCCTAGTAG  
GACCACACATCACTGCCTGAACCTCTTGGCAGAAGAACCCACCAGACATTGAGACATT  
GTATTTTGCCTTAGCAGGGATGAGTTGGTCTCTCTGGCTGGGCCATCCCATCCCCAATC  
TGGTCTTGCACACTCAGGCCTAATTCCTCTGACACACACACACACACACACACACAC  
ACACACACACACACACACAGTCCCTGCCCTAGGAGGCCAAATTACCCCTCCCTTGCT  
GAACACACCCTTGACCATGCACATGTCTAACCAACCGTACTGCACACACAGAGGCTGGA  
CCTGGGACACATCTCTTTACACCTTTTATTCTGTCTTTCTCCCAAGGCATCGTAACTT  
GGGGGCCAGGAGGGGACTGAGGGGCAGGGGGGAGGGGTGTAGCTGTGAGGCTCAGATGGA  
CTGGGAGGAGGGGGGAGGGTGATACATTAATTAATGGCTTCGTTAATTAATGTCATGTTG  
CTTGTGCTTTCTCAGTGTGTGTATGGTCCATGCCAGTGTGCTGGTGACAGGGTGGGTATC  
CATGATGTGTGCCAGCCTGGATGTGAGCTGTGTCTGTGGGGGCGTGTGTGTAACGTGA  
GTGTAGTCAGGTGCTCAACGGAGAATATAAACAACCAACCAACCAACCAACCAACCAAC  
AAAAATAAATGTATATTTTAAGTTTAAAGACAAATGAAACCAGACAAAACAATCCCCATCA  
GGTAGTTGTCCAACCCCCAGCTGGGTTCAACCCTCTCATTACCCACCTGACCTAGCTGTC  
CCCTTACTGTGGGCTGGGGGACTTGGGGGCCATTTCTTTGCCCTTTTTTTTTTGTGTGTA  
TTCTATTTTGTACAGACAAGTTGGGAAAACAACAGCGACAAAAAAGTCGAGAACTTT  
GTAAAAATATTGTGTGTGTGATTCTTGTAAAATATTTTCAAATGGTTTATTACAGAAGAT  
CAGTTATTAAATAATGTTTCATATTTTCACTTC

**FIGURE 3**



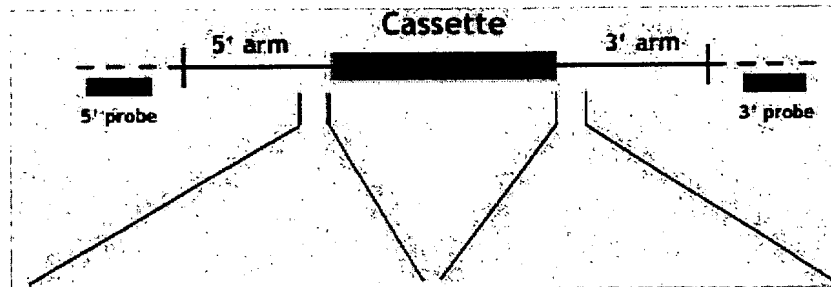
**Gene Sequence Structure\***

83 bp

Sequence Deleted

161 bp

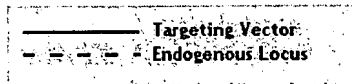
Size of partial cDNA: 2552 bp

**Targeting Vector\***  
(genomic sequence)**LacZ-Neo****Cassette**

Arm Length:

5': 3.5 kb

3': 1.6 kb



\* Not drawn to scale

5' >ACGGTGTAGGTCAGAGCCTTC  
TAGAGCATGCCCTGTGACTATGGA  
TCTCTCCCTGCATCCCCAGGTGG  
CAGATTCTTCAGTGAGGTGGATGC  
CAACCTGATGCTGGCACTGTACAA  
TAACTCCTTCTACACCCGAAAGGA  
ATCCTATGACTATCAGGCAGCCTG  
TGCCCCCTCAGCCTCCTGGGAACCT  
GGGTGCTGCAC<3'  
(SEQ ID NO:3)

5' >CCAGCAGCTACTCTATGGTCT  
CATCTATCACAGCTGGTTCAGGC  
AGGTAAGTAGGGTTTAGGATGCTT  
GGCCCCAAATCTGTGTCCAGGGCG  
GGAACAGATGCTCGGATCACAAGG  
AGAGTGGGGCTTAGGGCTGCGCCA  
AGCTGAGGCGGACGATTGTCTGTG  
GGCGGGGCTGAGGCGTCTGGGCCC  
CGCAGACCCGG<3'  
(SEQ ID NO:4)

**FIGURE 4**